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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/519,719	03/07/2000	Hamid Noorbakhsh	4150	8956

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APPLIED MATERIALS, INC.  
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SANTA CLARA, CA 95050

EXAMINER

ALEJANDRO MULERO, LUZ L

ART UNIT	PAPER NUMBER
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1763

DATE MAILED: 10/23/2002

9

Please find below and/or attached an Office communication concerning this application or proceeding.

AS-1

**Office Action Summary**

Application No.

09/519,719

Applicant(s)

NOORBAKHSH ET AL.

Examiner

Luz L. Alejandro

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 07 February 2002.
- 2a) ☐ This action is FINAL.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-52 is/are pending in the application.
- 4a) Of the above claim(s) 1-10, 16-20 and 29-36 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 11-15, 21-28 and 37-52 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 9.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

**DETAILED ACTION**

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 25 is rejected under 35 U.S.C. 102(a) as being anticipated by Lei et al., JP 11-100673A.

Lei et al. discloses a blocker plate 22 (which can be considered a liner for the lid assembly) made of quartz, and having a plurality of apertures formed at least partially therein in which gasses pass therethrough. The liner 22 also comprises a center member having the passages disposed within, a flange circumscribing the center member and a cylindrical wall projecting from the center member inside the flange (see fig. 10). The apparatus disclosed by Lei et al. further comprises a lid having an inlet, the lid disposed proximate the liner and defining a plenum at least partially therebetween (see fig. 2 and 10 and their description). The plenum defined by the lid and the cylindrical wall of the liner, and wherein a gas feedthrough is fluidly coupled to the plenum through a hole disposed in the lid (see fig. 10).

Claim 38 is rejected under 35 U.S.C. 102(b) as being anticipated by Shinichiro, JP 63-005526 A.

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Shinichiro shows the invention as claimed including an apparatus for lining a process volume defined by sidewalls of a semiconductor processing chamber comprising: a liner 4 adapted to be removably disposed in the process volume and including a wall; and a passage at least partially formed in the liner isolated from the process volume and adapted to flow a heat transfer medium therethrough (see Figures and abstract).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 11-15, 47-48, and 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pu et al., WO 99/48130 in view of Goto et al., U.S. Patent 5,843,277.

Pu et al. shows the invention substantially as claimed including a processing chamber comprising: a wall 12, a bottom wall 14 and a lid assembly 10 defining a chamber volume; a substrate support 16 disposed within the chamber volume; and chamber liner 26,27 disposed in the chamber volume and proximate the lid assembly and also circumscribing the substrate support 16 (see fig. 1 and page 4, line 14 to page 5, line 25). Additionally, Shan et al. discloses a processing chamber comprising:

Pu et al. fails to expressly disclose a passage at least partially disposed in the chamber liner, the passage fluidly isolated from the chamber volume and having an inlet and an outlet adapted to flow a fluid through the passage. Goto et al. discloses forming heat exchangable water jackets in chamber walls between their outer and inner surfaces (see col. 8-lines 20-42). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Pu et al. so as to incorporate a water jacket within the chamber liner of Pu et al. because this will allow for greater temperature control and minimize deposition of by-products on the chamber walls (see col. 8-lines 36-38).

With respect to claim 13, official notice was taken in the office action mailed 10-11-01 as to the use of clamps to retain chamber liners, and therefore this limitation is taken to be admitted prior art.

Claims 21-22, 24, and 49-50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pu et al., WO 99/48130 in view of Goto et al., U.S. Patent 5,843,277 as applied to claims 11-15, 47-48, and 51 above, and further in view of Lei et al., JP 11100673A.

Pu et al. and Goto et al. are applied as above but fail to expressly disclose a center member having the passage disposed within; a flange circumscribing the center member, a cylindrical wall projecting from the center member inside of the flange, a lid disposed opposite the cylindrical wall, the lid and the wall defining a plenum at least partially therebetween, a gas feedthrough fluidly coupled to the plenum through a hole disposed in the lid, a liner having a plurality of apertures formed at least partially therein, and a lid having an inlet, the lid disposed proximate the liner and defining a plenum at least partially therebetween. Lei et al. discloses a blocker plate 22 (which can be considered a liner for the lid assembly) made of quartz, and having a plurality of apertures formed at least partially therein in which gasses pass therethrough. The liner 22 also comprises a center member having the passages disposed within, a flange circumscribing the center member and a cylindrical wall projecting from the center member inside the flange (see fig. 10). The apparatus disclosed by Lei et al. further comprises a lid having an inlet, the lid disposed proximate the liner and defining a plenum at least partially therebetween (see fig. 2 and 10 and their description). The plenum defined by the lid and the cylindrical wall of the liner, and wherein a gas feedthrough is fluidly coupled to the plenum through a hole disposed in the lid (see fig. 10). In view of this disclosure, it would have been obvious to one of ordinary skill in the

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art at the time the invention was made to modify the apparatus of Pu et al. modified by Goto et al. so as to include the liner and lid structure of Lei et al. because this will improve the thermal management of the gas injected into the apparatus.

Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pu et al., WO 99/48130 in view of Goto et al., U.S. Patent 5,843,277 and further in view of Lei et al., JP 11100673A as applied to claims 21-22, 24, and 49-50 above, and further in view of Zhao et al., EP 0,855,735 A2.

Pu et al., Goto et al., and Lei et al. are applied as above but fail to expressly disclose a plurality of nozzles disposed in the center member providing fluid access to the plenum. Zhao et al. discloses (see fig. 3) where apertures in a showerhead/liner 40 emit gas such as in Lei et al. through the use of nozzles 42 (see col. 14-lines 43-51). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Pu et al. modified by Goto et al. and Lei et al. to incorporate nozzles into the apertures because this allows for better control of the gas being input to the chamber.

Claims 26, 28, and 52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lei et al., JP 11100673A in view of Zhao et al., EP 0,855,735 A2.

Lei et al. is applied as above but fails to expressly disclose a nozzle disposed in each of the apertures. Zhao et al. discloses (see fig. 3) where apertures in a showerhead 40 emit gas such as in Lei et al. through the use of nozzles 42 (see col. 14-

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lines 43-51). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Lei et al. to incorporate nozzles into the apertures because this allows for better control of the gas being input to the chamber.

Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lei et al., JP 11100673A in view of Zhao et al., EP 0,855,735 A2 as applied to claims 26, 28 and 52 above, and further in view of Takeuchi et al., U.S. Patent 5,824,158.

Lei et al. and Zhao et al. are applied as above but fail to expressly disclose that the nozzles are comprised of any of the claimed materials. Takeuchi et al. discloses a processing apparatus in which a nozzle made of quartz is used as to prevent the inclusion of impurities in the process gas (see col. 11-lines 53-56). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Lei et al. in view of Zhao et al. so as to include nozzles made of quartz because this will prevent the incursion of impurities in the process gas.

Claim 37 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lei et al., JP 11-100673A in view of Kugo et al., U.S. Patent 6,007,673.

Lei et al. is applied as above but fails to expressly disclose wherein the side of the liner facing the interior of the chamber is textured. Kugo et al. discloses texturing a liner, particularly a liner with apertures (see fig. 8) in order to trap particles and prevent

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them from incorporating themselves into a substrate (see abstract). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Lei et al. so as to texture the liner as taught by Kugo et al. because this will allow for a process to be performed within the apparatus with little contamination.

Claims 39-43 and 45-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shinichiro, JP 63-005526A.

Shinichiro is applied as above and also further comprises a bottom portion where the passage is formed at least partially in the bottom (see fig. 1).

Shinichiro fails to expressly disclose where the liner further comprises a cylindrical wall. With respect to the shape of the wall, a prima facie case of obviousness still exists because the choice of the particular shape of the wall is a matter of choice which a person of ordinary skill in the art would have found obvious absent persuasive evidence that the particular configuration of the claimed wall was significant (see *In re Dailey*, 357 F.2d 669, 149 USPQ 47 (CCPA 1966)).

Claim 44 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shinichiro, JP 63-005526A as applied to claims 39-43 and 45-46 above, and further in view of Pu et al., WO 99/48130.

Shinichiro is applied as above but fails to expressly disclose wherein the wall of the liner is configured to line a substrate support disposed in the process volume of the

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chamber. Pu et al. discloses a wall 12, a bottom wall 14 and a lid assembly 10 defining a chamber volume; a substrate support 16 disposed within the chamber volume; and chamber liner 26,27 disposed in the chamber volume and proximate the lid assembly and also circumscribing the substrate support 16 (see fig. 1 and page 4, line 14 to page 5, line 25). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Shinichiro so as to also incorporate the liner onto the substrate support as taught by Pu et al. because this would provide for increased temperature control over the surfaces of the chamber as well as easier cleaning of the chamber.

### ***Response to Arguments***

Applicant's arguments with respect to claims 11-15, 21-28, and 37-52 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luz L. Alejandro whose telephone number is 305-4545. The examiner can normally be reached on Monday-Thursday from 7:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills, can be reached on 308-1633. The fax phone numbers for the organization where this application or proceeding is assigned are 872-9310 for regular communications and 872-9311 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 308-0661.

A handwritten signature in cursive script, appearing to read "Alejandro", written in dark ink.

Luz L. Alejandro  
Patent Examiner  
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October 20, 2002